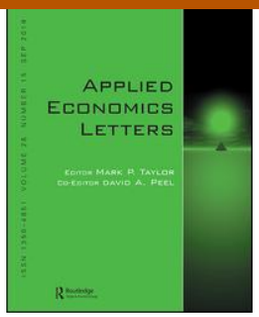

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ARTICLE

No evidence for second leg home advantage in recent seasons of European soccer cups

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ABSTRACT

Previous research on the advantage experienced by soccer teams playing the second leg of a knock-out confrontation at home yielded ambiguous evidence. Some studies confirmed the well-established soccer myth that this advantage is substantial while others did not find any significant evidence. We contribute to this literature by analysing all 'non-seeded' two-leg confrontations in the UEFA Champions League and the UEFA Europa League between 2010 and 2017. We find that playing the second leg of a knock-out confrontation at home is not associated with a substantially higher chance of proceeding to the next stage of the tournament.

KEYWORDS

Soccer economics; sport sciences; home advantage; UEFA Champions League; UEFA Europa League

JEL CLASSIFICATION

L83; J44; Z00

I. Introduction

Soccer is big business. Losing or winning a particular game might have serious financial implications for professional soccer clubs. In 2018, proceeding to the final of the UEFA Champions League resulted in 11 million euros of prize money (UEFA 2017). Unsurprisingly, economists and sports scientists have been focussing on identifying determinants of success in professional soccer (see e.g. Gómez, Pollard, and Luis-Pascual 2011; Gómez et al. 2012).[1] For instance, scholars have investigated the impact of red cards and substitutions on performance in the remaining time (Mechtel et al. 2011; De Meyere, Vanruymbeke, and Baert 2018; Amez et al. 2019). Furthermore, the presumed 'referee bias' in soccer has been the subject of scientific research lately (Dohmen and Sauermann 2016). Moreover, Szymanski (2003) states that sports data may yield fruitful information about labour market behaviour. As such, the sports sector facilitates examining the determinants and effects of behaviour and performance (see e.g. van Ours and van Tuijl 2016; Schneemann and Deutscher 2017).

In addition, there is an exhaustive scientific literature on home advantage in professional soccer (Pollard 2008; Pollard and Gómez 2014a; Pollard and Gomez, 2014b; Van Damme and Baert 2018; Pic 2018c). In particular, there has been interest in the advantage a team may experience when it plays the second game of a two-legged knock-out confrontation at home. This advantage has been explained by postulating that at the moment of these second game teams still have the opportunity to proceed to the following stage in the tournament. As such, the home advantage may be strong in the second and decisive leg. This second leg home advantage is supposed to be present especially when the confrontation is tied and added time or decisive penalty kicks are needed to determine the winning team (Page and Page 2007; Eugster, Gertheiss, and Kaiser 2011; Lidor et al. 2011; Flores, Forrest, and de Pablo 2015; Mueller-Langer and Andreoli-Versbach 2016).

Six research articles in the peer-reviewed literature have confronted this presumed advantage with the empirical reality. Those articles, summarised in Table A1,[2] show mixed results. On the one hand, Page and Page (2007), Pic and Castellano (2017), Flores, Forrest, and de Pablo (2015), and Lidor et al. (2011) conclude that teams that host the return game proceed more often to the next stage. By contrast, the studies

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[1]Beside professional soccer, scholars have investigated determinants of success in other professional sports (see e.g. Pic 2018a, 2018b).

[2]We limited our summary to peer-reviewed articles published in English. However, we are aware of one non-English research article by Pic and Castellano (2016) covering the second leg home advantage.

of Eugster, Gertheiss, and Kaiser (2011) and Meuller-Langer and Andreoli-Versbach (2016) do not find empirical evidence for the second leg home advantage. Moreover, Page and Page (2007) insinuate that the second leg home advantage they find, has declined over time.

In this research letter, we contribute to the literature by analysing the second leg home advantage based on more recent data compared to previous contributions. Concretely, we analyse all 'non-seeded' confrontations in the UEFA Champions League and the UEFA Europa League since 2009. In our analyses, we control in different ways for the correlations between the teams' strength and their second leg home status.

II. Data

The UEFA Champions League and the UEFA Europa League have been organised in their current structure since the 2009/2010 season. The last stages of these tournaments are organised as two-legged knock-out confrontations. A non-seeded draw decides which team hosts the first leg. Concretely, this covers the 'round of 16′ (8 two-legged contests), the quarter-finals (4 two-legged contests) and semi-finals (2 two-legged contests) of the EUFA Europa League and the quarter-finals and the semi-finals of the UEFA Champions League.[3] From the 2009/2010 season until the 2016/2017 season this amounts to 160 confrontations.

From the official website of the UEFA (i.e. www.uefa.com) we derived which soccer teams participated and which proceeded to the next stage in these two-legged confrontations. Furthermore, we collected information on the relative strength of those teams. Since a random draw assigns which team plays first away, in an infinitely large sample, there cannot be any correlation between the relative strength of the teams and whether those teams play their second leg at home. However, we wanted to control for such correlation, since it may be present in a finite sample. Concretely, in our main analyses, we applied the measure for relative strength used by Eugster, Gertheiss, and Kaiser (2011). They measured relative strength as the difference between the UEFA coefficient of a team and that of the opponent, normalised by dividing by the highest observed UEFA coefficient. Based on the bookmaker odds prior to the first leg, we additionally constructed an alternative strength indicator by subtracting the mean of the winning odds of the home (away) team from the winning odds of the home (away) team. Additionally, as robustness checks, we calculated the indicator of Baert and Amez (2018) and constructed country-indicators for all teams.[4]

III. Results

Figure 1 describes the outcome of the analysed contests. In contrast, with the supposed advantage for the teams that play the second leg at home, these teams only proceed to the next knock-out stage in 48.8% of the confrontations. Thus, clubs that play the first leg at home win the two-legged confrontation slightly more often.

The linear regression analyses presented in Table 1, however, show that this difference is not statistically significant. In model (1), we regress (as a linear probability model) whether a club proceeds to the next stage of the knock-out phase on a binary variable for teams that play the second leg at home. In analogy with Verstraeten and Baert (2018), the unit of observation is the game. So, every confrontation is included once from the point of view of the home team and once from the point of view of the away team. Standard errors are clustered on the confrontation level (160 two-legged confrontations). In model (2), we also include our main indicator for the relative strength of the teams. Finally, in the model (3), we additionally include the strength indicator based on bookmaker odds.[5]

[3]The round of 32 of the UEFA Europa League and the round of 16 of the UEFA Champions League are organised as two-legged confrontations as well. The drawing of these rounds, however, is not random but depends on the performance of the teams in the previous group stage. Including the information of these stages, which has been done in earlier contributions mentioned in our introduction, can only be done in a credible manner in case one is able to control for the relative strength of the teams. Therefore, we only included these data in the context of robustness checks.

[4]The indicator of Baert and Amez (2018) defines relative strength as the natural logarithm of the quotient of the home and away teams' UEFA team coefficient for that season plus 1 (to avoid division by 0 for teams who did not participate in one of the two European competitions during the five previous seasons).

[5]Including this extra indicator is possible since (i) the correlation between both indicators for relative strength is reasonable ($r = 0.452$) and (ii) the multicollinearity diagnostics yield variance inflation factors lower than 2, which is substantially below the threshold value of 10.

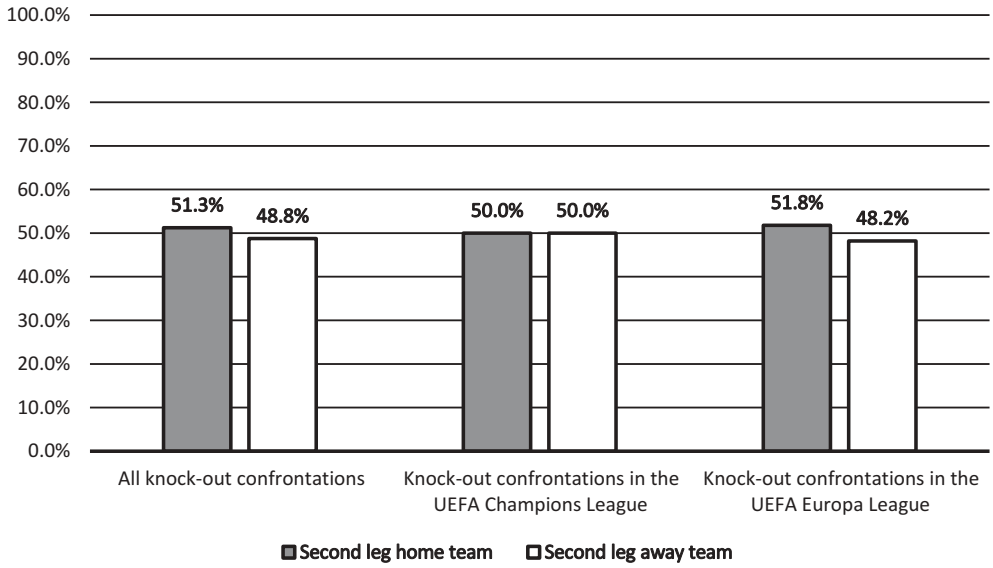

Figure 1. Descriptive statistics: the chance of proceeding to the next stage.

Table 1. Regression analyses.

	(1)	(2)	(3)
Second leg home team	−0.025	−0.062	−0.127
	(0.079)	(0.075)	(0.079)
Relative strength: UEFA coefficients		0.603***	0.496***
		(0.100)	(0.114)
Relative strength: bookmaker odds			0.030**
			(0.012)
Intercept	0.513***	0.531***	0.528***
	(0.040)	(0.037)	(0.037)
R^2	0.001	0.137	0.153
N	320	320	320

Notes. Linear probability models (LPM) were estimated. The dependent variable is whether the team proceeds to the next stage. The presented statistics are estimated coefficients and standard errors, clustered at the game level, in parentheses. *** (**) ((*)) indicate significance at the 1%- (5%-) ((10%-)) significance level.

The estimation results of model (1) show that the chance of proceeding to the next stage for the second leg home team is 2.5 percentage points lower than for the club that plays the first game at home. This small difference is not statistically significant ($p = 0.753$), and therefore, we cannot reject that both teams have, on average, equal chances of proceeding. After controlling for the relative strength of the teams by our main indicator, the coefficient for the clubs playing the second leg at home is slightly more negative but still insignificant ($p = 0.408$). When we additionally control for the relative strength based on the bookmaker odds, the negative coefficient is slightly bigger in magnitude but again statistically insignificant ($p = 0.112$).

These findings remain valid when we divide our sample into two subsamples depending on the tournament. As Figure 1 shows, the first leg home teams and the second leg home teams proceeded just as often to the next round in the UEFA Champions League. In the UEFA Europa League, the chance of proceeding is higher (51.8%) for the first leg home teams. A regression analysis on the latter subsample shows that this small difference is also statistically insignificant.

We performed multiple sensitivity analyses to check the robustness of our findings. In addition to the linear regressions, we performed probit estimations. Next, we opted for alternative variables to control for the relative strength of the teams. Third, we performed regressions at the confrontation level (in this case we randomly drew one of the teams, from the point of view of which we constructed the variables) instead of using the game as the unit of observation. Finally, we included the confrontations in the round of 32 of the UEFA Europa League and the round of 16 of the UEFA Champions League in our regressions and controlled for the performance of the teams in the group phase. We never found a statistically significant (dis)advantage for second leg home teams.

IV. Discussion

In contrast, with Pic and Castellano (2017), Flores et al. (2015), and Lidor et al. (2011) the current study does not find any empirical evidence for this second leg home advantage. These contrasting results are in line with the findings of Page and Page (2007) who found evidence for a decrease in the second leg home advantage over time. Since the data analysed in the current study covers the most recent seasons of the UEFA Champions League and the UEFA Europa League, the lack of evidence for the second leg home advantage may be the result of this trend.

As mentioned, the second leg home advantage is often linked to the idea that every situation can still be fixed in the second leg and, therefore, the home advantage in that game is crucial. This mechanism seems to be compensated for by other dynamics. Probably, a second leg home team that has to overcome a bad first leg result can only do so by taking big tactical risks (Pollard 2008) that are linked with higher chances of conceding goals (Mueller-Langer and Andreoli-Versbach 2016).

V. Conclusion

In this research letter, we contributed to the recent scientific literature on determinants of success in professional soccer in general and the impact of playing the second leg of a knock-out confrontation at home in particular. We identified this effect for the most recent data on the most prestigious soccer tournaments for clubs in the world. Our analysis provided no evidence for a second leg home advantage. Thus, the European football association UEFA seems to be wrong when it assumes it rewards teams for their good performance in the group stage by letting these teams play the second leg at home in the round of 32 and the round of 16 of the UEFA Europa League and the UEFA Champions League.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix

Table A1. Literature overview.

Study	Data	Conclusion
Eugster et al. (2011)	UEFA Champions League (1995–2010)	No substantial second leg home advantage.
Flores et al. (2015)	UEFA Champions League and UEFA Europa League (1998–2013)	Second leg home advantage (52.7% chance of proceeding to the next stage).
Lidor et al. (2010)	UEFA Champions League (1995–2007)	Second leg home advantage (61.8% chance of proceeding to the next stage).
Mueller-Langer & Andreoli-Versbach (2016)	UEFA Champions League, UEFA Europa League and UEFA Cup Winners Cup (1956–2010)	No substantial second leg home advantage.
Page & Page (2007)	UEFA Champions League, UEFA Europa League and UEFA Cup Winners Cup (1955–2006)	Second leg home advantage (54.3% chance of proceeding to the next stage). (Limited) evidence for a decrease in the second leg home advantage over time.
Pic & Castellano (2017)	Spanish Copa del Rey (1940–2014)	Second leg home advantage (55% chance of proceeding to the next stage).